

2019 Annual Report

Atikokan Drinking Water System



Prepared by Northern Waterworks Inc. on behalf of the Town of Atikokan

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1 INTRODUCTION

1.1 Annual Reporting Requirements

This consolidated Annual Report (the Report) has been prepared in accordance with both section 11 (Annual Reports) and Schedule 22 (Summary Reports for Municipalities) of Ontario Regulation 170/03 (Drinking Water Systems Regulation). This Report is intended to inform both the public and Municipal Council on the operation of the system over the previous calendar year (January 1 to December 31, 2019).

Section 11 of O. Reg. 170/03 requires the development and adequate distribution to the public of an annual report summarizing water quality monitoring results, adverse water quality incidents, system expenses and chemicals used in the water treatment process.

Schedule 22 of O. Reg. 170/03 requires the development and distribution to Council of an annual report summarizing incidents of regulatory non-compliance and associated corrective actions, in addition to providing flow monitoring results for the purpose of enabling the Owner to assess the capability of the system to meet existing and planned demand.

1.2 Report Availability

In accordance with section 11 of O. Reg. 170/03 this Report must be given, without charge, to every person who requests a copy. Effective steps must also be taken to advise users of water from the system that copies of the report are available, without charge, and of how a copy may be obtained. This Annual Report shall be made available for inspection by the public at the Atikokan Public Library, on the Town of Atikokan's website and on NWI's website.

In accordance with Schedule 22 of O. Reg. 170/03 this Annual Report must be given to the members of Municipal Council. Section 19 (Standard of care, municipal drinking-water system) of Ontario's *Safe Drinking Water Act* also places certain responsibilities upon those municipal officials who oversee an accredited operating authority or exercise decision-making authority over a system. The examination of this Report is one of the methods by which municipal officials may fulfil the obligations required by section 19 of O. Reg. 170/03.

System users and members of Council are strongly encouraged to contact a representative of NWI for assistance in interpreting this Report. Questions and comments may be directed to the local NWI Operations Manager or by email to compliance@nwi.ca.

2 SYSTEM OVERVIEW

2.1 System Description

The Atikokan Drinking Water System (DWS No. 220000950) must meet extensive treatment and testing requirements in order to ensure that human health is protected. The operation and maintenance of the system is governed by Ontario's *Safe Drinking Water Act* and the regulations therein, in addition to requirements within system-specific approvals.

The Atikokan Drinking Water System (DWS) is classified as a large municipal residential system and is composed of a raw water pumping station, the Atikokan Water Treatment Plant (WTP) and the Atikokan water distribution system. The system is owned by the Corporation of the Town of Atikokan and is operated, maintained and managed by Northern Waterworks Inc. Potential pathogenic organisms are removed and inactivated by chemical coagulation, sand-ballasted flocculation, clarification, rapid sand filtration and free chlorine disinfection processes.

Pumps located at the raw water pumping station transfer source water from the Atikokan River and through a transmission line to the two proprietary Actiflo treatment units at the WTP, each of which includes a coagulation basin, injection basin, maturation basin and settling zone. Polyaluminum chloride (coagulant) is injected into the raw water immediately upstream from the coagulation basin. Water and coagulant are rapidly mixed in the coagulation basin and flow is directed to the injection basin, where microsand and polymer solution (flocculant) are added to enhance the formation of robust flocs. Floc formation continues in the maturation basin before water is directed to the settling zone, where its velocity is reduced to allow for the separation and settling of floc. Supernatant then overflows into a launder and is directed to the filter units.

Impurities that were not captured and settled in the clarifier are removed by passing water through four dual media filters composed of anthracite and silica sand. The filters are periodically cleaned by reversing the flow of water through the filter using pumps. Chlorine gas (disinfectant), sodium carbonate solution (pH adjustment) and hydrofluorosilicic acid (fluoridation) are added to the filtrate as it is directed from the filters to the treated water storage reservoir.

The reservoir at the Atikokan WTP uses a baffling system to ensure that disinfectant is adequately mixed with the water, and disinfected water is held in the reservoir for a sufficient amount of time to achieve primary disinfection. Treated water is then delivered from the reservoir to the distribution system using pumps located at the WTP. Secondary disinfection requirements in the water distribution system are achieved by maintaining a free chlorine residual at all locations.

2.2 Water Treatment Chemicals

In accordance with section 11 of O. Reg. 170/03, this Report must include a list of all water treatment chemicals used by the system during the period covered by the report (**Table 1**). All chemicals used in the treatment process are NSF/ANSI 60 certified for use in potable water, as required by system approvals.

Table 1: Water treatment chemicals used in 2019

| Treatment Chemical | Application |
|----------------------------------|--------------------------|
| polyaluminum chloride (SternPAC) | coagulant |
| silica dioxide (Actisand) | flocculant |
| polymer (Superfloc C-492) | flocculant |
| sodium carbonate (soda ash) | pH/alkalinity adjustment |
| hydrofluorosilicic acid | fluoridation |
| chlorine gas | disinfectant |

2.3 System Expenses

In accordance with section 11 of O. Reg. 170/03, this Report must describe any major expenses incurred during the reporting period to install, repair or replace required equipment. This Report also includes those expenses related to strengthening equipment inventories and to maintenance activities undertaken by subcontracted service providers. Major expenses incurred in 2019 are summarized in **Table 2**.

Table 2: Major expenses incurred in 2019

| Category | Description | Expense |
|-------------------|---|----------|
| Replace | 2-inch and 8-inch automated butterfly valves for filter units | \$19,373 |
| Inventory | Soda ash chemical metering pump | \$12,556 |
| Repair | High lift pump no. 1 repairs ¹ | \$11,672 |
| Replace | Booster pumps for polymer chemical feed system (2) | \$8,970 |
| Replace | Filter room suspension heaters (2) | \$7,374 |
| Repair | Miscellaneous automation and programming services | \$5,825 |
| Replace | Fire alarm system | \$4,786 |
| Replace | Chlorine gas cylinder weighing scales and associated components | \$4,426 |
| Replace | 8-inch manual butterfly valves for Actiflo treatment units (2) | \$3,968 |
| Inventory/Replace | Polymer and coagulant chemical metering pumps (2) | \$3,863 |
| New Equipment | UV transmittance benchtop instrument | \$3,443 |
| Maintenance | Flow meter calibration verifications | \$3,294 |
| New Equipment | Submersible water heater for polymer chemical feed system | \$3,199 |
| Replace | Refrigerated air dryer for air compressors | \$2,694 |
| New Equipment | Spill containment workstations (6) and associated components | \$2,603 |
| Replace | Gas chlorine rotameters (2) | \$2,339 |
| Inventory | Ultrasonic liquid level transmitter | \$2,275 |
| Maintenance | Backflow prevention device testing | \$2,204 |
| Inventory | Hydrostatic level transmitter for filter unit | \$1,845 |
| Replace | Hydrofluorosilicic acid drum pump | \$1,634 |
| Replace | Fan motor for WTP furnace | \$1,362 |

1. High lift pump repairs included replacing pump shaft bushings, repairing the concrete base and installing a new sole plate.

3 WATER QUALITY

3.1 Overview

In accordance with section 11 of O.Reg. 170/03, this Report must summarize the results of water quality tests required by regulations, approvals, and orders. The following sections use technical water quality terms, some of which the reader may not be familiar with. It is recommended that the reader refer to the *Technical Support Document for Ontario Drinking Water Standards, Objectives, and Guidelines* available at the following website:

<http://www.ontla.on.ca/library/repository/mon/14000/263450.pdf>. Within this document the reader will find information on provincial water quality standards, objectives and guidelines, rationale for monitoring, and a brief description of water quality parameters.

3.2 Microbiological Parameters

Microbiological tests are performed on source, treated and distribution water. 261 routine water samples were collected for microbiological analysis by an accredited laboratory in 2019, as required by Schedule 10 (Microbiological sampling and testing) of O. Reg. 170/03. These samples were collected on a weekly basis and included tests for E. coli (EC), total coliforms (TC) and heterotrophic plate counts (HPC). Results from microbiological analyses are summarized in **Table 3**. All results were below the Ontario Drinking Water Quality Standards.

Table 3: Results summary for microbiological parameters

| Sample Type | # of Samples | EC Results Range ¹ (MPN/100mL) | TC Results Range ¹ (MPN/100mL) | # of HPC Samples | HPC Results Range (CFU/mL) |
|---------------------------|--------------|---|---|------------------|----------------------------|
| Raw Water | 52 | 1 to 67 | 26 to >2420 | --- | --- |
| Treated Water | 53 | absent | absent | 52 | 0 to 1 |
| Distribution | 156 | absent | absent | 52 | 0 to 1 |
| Distribution (nonroutine) | 24 | absent | absent | --- | --- |

1. The Ontario Drinking Water Quality Standard for E. Coli and Total Coliforms in a treated or distribution sample is 'not detectable'. The presence of either parameter in a treated or distribution sample is considered an exceedance..

3.3 Operational Parameters

In accordance with Schedule 7 (Operational checks) of O. Reg. 170/03, regulated operational parameters that must be monitored include raw water turbidity, filtrate turbidity, treated water fluoride residual and the free chlorine residuals associated with primary and secondary disinfection. A comprehensive monitoring program is employed that extends beyond these regulated operational parameters to include additional tests conducted on source, process and treated water samples. **Table 4** summarizes water quality results for regulated and selected unregulated operational parameters. In accordance with Schedule 6 (Operational checks, sampling and testing – general) of O. Reg. 170/03, certain operational parameters are continuously monitored. No Adverse Water Quality Incidents (AWQIs) pertaining to operational parameters occurred during the reporting period.

Table 4: Results summary for operational parameters

| Parameter (Sample Type) | Sample Method (Minimum Frequency) | Units | Minimum Result | Maximum Result | Annual Average | Adverse Result ¹ |
|--|-----------------------------------|-------|----------------|----------------|----------------|-----------------------------|
| Turbidity (Raw Water) | Grab (5x weekly) | NTU | 0.64 | 6.30 | 1.01 | n/a |
| Turbidity (Filter 1) | Continuous | NTU | 0.049 | 1.85 | 0.074 | >1.0 |
| Turbidity (Filter 2) | Continuous | NTU | 0.047 | 1.08 | 0.071 | >1.0 |
| Turbidity (Filter 3) | Continuous | NTU | 0.020 | >2.0 | 0.056 | >1.0 |
| Turbidity (Filter 4) | Continuous | NTU | 0.030 | >2.0 | 0.058 | >1.0 |
| Turbidity (Treated) | Grab (Daily) | NTU | 0.11 | 0.31 | 0.19 | n/a |
| pH (Treated) | Grab (Daily) | --- | 6.5 | 7.8 | 7.1 | n/a |
| FR ² (Treated) | Continuous | mg/L | 0.49 | 1.14 | 0.71 | >1.5 |
| FCR ² (Treated) | Continuous | mg/L | 1.13 | 3.06 | 2.04 | n/a |
| FCR ² (Distribution) ³ | Grab (Daily) | mg/L | 0.55 | 2.08 | n/a | <0.05 |

1. Adverse results are prescribed within Schedule 16 of O. Reg. 170/03. There are additional factors not included in the table that are necessary to determine whether a result is adverse, such as the duration of the result and whether water is being directed to the next stage of treatment.
2. FR = fluoride residual; FCR = free chlorine residual.
3. Grab samples are collected and tested for free chlorine residual at various locations throughout the water distribution system. The free chlorine residual varies with water age and distribution system location, and for this reason an annual average cannot be provided. The values in the table pertain to the minimum and maximum results collected across all locations in the calendar year.

3.4 Conventional Filtration Performance

In accordance with the system's *Municipal Drinking Water Licence*, conventional filtration facilities must meet certain performance criteria in order to claim log removal and inactivation credits for *Cryptosporidium* oocysts, *Giardia* cysts and viruses. In addition to continuously monitoring filtrate turbidity and other requirements, filtrate turbidity must be less than or equal to 0.3 NTU in at least 95% of the measurements each month. **Table 5** summarizes filtrate turbidity compliance against the <0.3 NTU/95% performance criterion. Minimum and maximum values in the table correspond to the proportion of time that filtered water turbidity was less than or equal to 0.3 NTU in a calendar month in 2019. No AWQIs pertaining to filtration performance occurred during the reporting period.

Table 5: Filtration performance summary

| Filter | Minimum Result | Maximum Result | Adverse Result |
|----------|----------------|----------------|----------------|
| Filter 1 | 99.86% | 100% | <95% |
| Filter 2 | 99.76% | 100% | <95% |
| Filter 3 | 99.84% | 100% | <95% |
| Filter 4 | 99.69% | 100% | <95% |

3.5 Nitrate & Nitrite

Treated water is tested for nitrate and nitrite concentrations on a quarterly basis in accordance with Schedule 13 (Chemical sampling and testing) of O. Reg. 170/03. Nitrate and nitrite results are provided in **Table 6**. All results were below the Ontario Drinking Water Quality Standards.

Table 6: Nitrate and nitrite results

| Sample Date | Nitrate Result (mg/L) | Nitrite Result (mg/L) |
|-------------|-----------------------|-----------------------|
| 19-Feb-2019 | 0.064 | <0.010 |
| 13-May-2019 | <0.020 | <0.010 |
| 12-Aug-2019 | <0.020 | <0.010 |
| 18-Nov-2019 | <0.020 | <0.010 |
| ODWQS | 10 | 1 |

3.6 Trihalomethanes & Haloacetic Acids

Trihalomethanes (THMs) and haloacetic acids (HAAs) are required to be sampled on a quarterly basis from a distribution system location that is likely to have an elevated potential for their formation, in accordance with Schedule 13 (Chemical sampling and testing) of O. Reg. 170/03. Total THM and HAA results are provided in **Table 7** and **Table 8**, respectively.

Compliance with the provincial standard for trihalomethane concentrations is determined by calculating a running annual average (with a Maximum Acceptable Concentration of 0.100 mg/L or 100 µg/L). A new provincial standard for haloacetic acids, also expressed as a running annual average with a Maximum Acceptable Concentration of 0.080 mg/L or 80 µg/L, came into effect on January 1, 2020. The 2019 running annual averages for THMs and HAAs were below the respective Ontario Drinking Water Quality Standards.

Table 7: Total THM results

| Sample Date | Result (µg/L) |
|--------------------|---------------|
| 19-Feb-2019 | 54.2 |
| 13-May-2019 | 62.9 |
| 12-Aug-2019 | 121 |
| 18-Nov-2019 | 91.1 |
| Regulatory Average | 82.3 |
| ODWQS (RAA) | 100 |

Table 8: Total HAA results

| Sample Date | Result (µg/L) |
|--------------------|---------------|
| 19-Feb-2019 | 73.1 |
| 13-May-2019 | 68.2 |
| 12-Aug-2019 | 98.5 |
| 18-Nov-2019 | 75.7 |
| Regulatory Average | 78.9 |
| ODWQS (RAA) | 80 |

3.7 Environmental Discharge Sampling

The *Municipal Drinking Water Licence* for the Atikokan Drinking Water System requires additional sampling associated with environmental discharges. During normal water treatment plant operation, process wastewater is transferred directly to the wastewater collection (sanitary sewer) system. If conditioned process wastewater is discharged to the natural environment, composite samples must be collected and analyzed for total suspended solids (TSS). The *Licence* also requires that the effluent discharged to the natural environment has an annual average TSS concentration below 25 mg/L. In 2019, there were seven (7) discharge events and the effluent discharged to the natural environment had an annual average TSS concentration of 8.2 mg/L.

3.8 Lead Sampling

Based on the results of community lead sampling conducted in 2014 and 2015, the Atikokan DWS qualified for reduced lead sampling in accordance with Schedule 15.1 (Lead) of O.Reg. 170/03. Reduced sampling for lead resumed in the Winter 2018 sample period (i.e. December 15, 2017 to April 15, 2018). However, unfavourable lead results from this sample period required the system to return to the standard lead sampling schedule beginning in the Summer 2018 sample period (i.e. June 15, 2018 to October 15, 2018). The system adhered to the standard lead sampling schedule for both 2019 sample periods. **Table 9** summarizes the results of community lead sampling conducted during the reporting period.

Table 9: Lead sampling results summary

| Sample Period | Winter 2019 (15-Dec-2018 to 15-Apr-2019) | Summer 2019 (15-Jun-2019 to 15-Oct-2019) | |
|---|--|--|----------|
| Sample Type | Plumbing | Distribution | Plumbing |
| Total No. of Sample Points ¹ | 22 | 4 | 22 |
| Total No. of Samples | 44 | 4 | 44 |
| Minimum Result (µg/L) | <1.0 | <1.0 | <1.0 |
| Maximum Result (µg/L) | 14.3 | 1.4 | 24.9 |
| No. of Sample Points greater than ODWQS (>10 µg/L) | 1 | 0 | 1 |
| Sample Point ODWQS Exceedance Rate | 4.5% | 0% | 4.5% |
| No. of Samples greater than ODWQS (>10 µg/L) | 1 | 0 | 1 |
| No. of Samples between LDL ² and ODWQS (1 - 10 µg/L) | 17 | 1 | 17 |
| No. of Samples below LDL ² (<1.0 µg/L) | 26 | 3 | 26 |

1. In accordance with the sampling protocol outlined in Schedule 15.1 of O. Reg. 170/03, two samples are collected and analyzed for lead at each sample point for plumbing samples.
2. LDL = lower detectable limit (i.e. <1.0 µg/L); lead concentrations below the LDL are not detected by the analytical method.

3.9 Inorganic Parameters

Most inorganic parameters are sampled on an annual basis in treated water in accordance with Schedules 13 (Chemical sampling and testing) and 23 (Inorganic parameters) of O. Reg. 170/03. Sodium is sampled every five (5) years in treated water in accordance with Schedules 13 and 23 of O. Reg. 170/03. Although grab samples may be analyzed, regulatory testing for fluoride is achieved using continuous monitoring equipment in accordance with Schedule 6 of O. Reg. 170/03.

The most recent inorganic parameter sampling results are provided in **Table 10**. In order to shift the annual sample collection date from November to August in a given calendar year, two sets of treated water samples were collected and tested for most regulated inorganic parameters in 2019. Results in the table are identical for both sample collection dates. All results were below the associated Ontario Drinking Water Quality Standards.

Table 10: Inorganic parameter sampling results

| Parameter | Sample Date(s) | Units | Result(s) | ODWQS |
|-----------|--------------------------|-------|-----------|-------|
| Antimony | 23-Sep-2019, 18-Nov-2019 | µg/L | <0.60 | 6 |
| Arsenic | 23-Sep-2019, 18-Nov-2019 | µg/L | <1.0 | 10 |
| Barium | 23-Sep-2019, 18-Nov-2019 | µg/L | <10 | 1000 |
| Boron | 23-Sep-2019, 18-Nov-2019 | µg/L | <50 | 5000 |
| Cadmium | 23-Sep-2019, 18-Nov-2019 | µg/L | <0.10 | 5 |
| Chromium | 23-Sep-2019, 18-Nov-2019 | µg/L | <1.0 | 50 |
| Fluoride | 12-Aug-2019 | mg/L | 0.529 | 1.5 |
| Mercury | 12-Aug-2019, 18-Nov-2019 | µg/L | <0.10 | 1 |
| Selenium | 23-Sep-2019, 18-Nov-2019 | µg/L | <1.0 | 50 |
| Sodium | 12-Aug-2019 | mg/L | 16.3 | 20 |
| Uranium | 23-Sep-2019, 18-Nov-2019 | µg/L | <2.0 | 20 |

3.10 Organic Parameters

Organic parameters are sampled on an annual basis in treated water in accordance with Schedules 13 (Chemical sampling and testing) and 24 (Organic parameters) of O. Reg. 170/03. Organic parameter sampling results are provided in **Table 11**. In order to shift the sample collection date from February to August in a given calendar year, two sets of treated water samples were collected and tested for all regulated organic parameters in 2019. One set of samples was collected on August 12, while the second set of samples was collected on November 18. Results in the table are identical for both sample collection dates. All results were below the associated Ontario Drinking Water Quality Standards.

Table 11: Organic parameter sampling results

| Parameter | Result (µg/L) | ODWQS (µg/L) | Parameter | Result (µg/L) | ODWQS (µg/L) |
|------------------------|---------------|--------------|---------------------------|---------------|--------------|
| Alachlor | <0.10 | 5 | Diuron | <1.0 | 150 |
| Atrazine & Metabolites | <0.20 | 5 | Glyphosate | <5.0 | 280 |
| Azinphos-methyl | <0.10 | 20 | Malathion | <0.10 | 190 |
| Benzene | <0.50 | 1 | MCPA | <0.20 | 100 |
| Benzo(a)pyrene | <0.0050 | 0.01 | Metolachlor | <0.10 | 50 |
| Bromoxynil | <0.20 | 5 | Metribuzin | <0.10 | 80 |
| Carbaryl | <0.20 | 90 | Monochlorobenzene | <0.50 | 80 |
| Carbofuran | <0.20 | 90 | Paraquat | <1.0 | 10 |
| Carbon Tetrachloride | <0.20 | 2 | Pentachlorophenol | <0.50 | 60 |
| Chlorpyrifos | <0.10 | 90 | Phorate | <0.10 | 2 |
| Diazinon | <0.10 | 20 | Picloram | <0.20 | 190 |
| Dicamba | <0.20 | 120 | Total PCBs | <0.035 | 3 |
| 1,2-Dichlorobenzene | <0.50 | 200 | Prometryne | <0.10 | 1 |
| 1,4-Dichlorobenzene | <0.50 | 5 | Simazine | <0.10 | 10 |
| 1,2-Dichloroethane | <0.50 | 5 | Terbufos | <0.20 | 1 |
| 1,1-Dichloroethylene | <0.50 | 14 | Tetrachloroethylene | <0.50 | 10 |
| Dichloromethane | <5.0 | 50 | 2,3,4,6-Tetrachlorophenol | <0.50 | 100 |
| 2,4 -Dichlorophenol | <0.30 | 900 | Triallate | <0.10 | 230 |
| 2,4-D | <0.20 | 100 | Trichloroethylene | <0.50 | 5 |
| Diclofop-methyl | <0.20 | 9 | 2,4,6-Trichlorophenol | <0.50 | 5 |
| Dimethoate | <0.10 | 20 | Trifluralin | <0.10 | 45 |
| Diquat | <1.0 | 70 | Vinyl Chloride | <0.20 | 1 |

3.11 Additional Herbicide Monitoring

On April 24, 2019, the Town of Atikokan received notification from the Canadian National Railway (CN) about the annual vegetation control program being carried out in and around the community. On May 8, 2019, NWI received notification from the Town about the program and proceeded to implement a monitoring program for common herbicides (i.e. Schedule 24 regulated herbicides). Vegetation control in the area was conducted during the week of June 10, 2019. The area sprayed consisted of only the ballast section (the graveled area which covers a 4.9 m width).

The results from additional monitoring for herbicides are provided in **Table 12**. The table includes the results from samples collected on August 12 and November 18 as part of the routine sampling program described in section 3.10 of this Report. Raw and/or treated water samples were collected on multiple occasions preceding, during and following vegetation control. No herbicides were detected in any of the samples and all results were below the associated Ontario Drinking Water Quality Standards.

Table 12: Additional herbicide monitoring results

| Parameter | | Bromoxynil | 2,4-D | Dicamba | MCPA | Picloram | Glyphosate | Diuron |
|--------------------|---------|----------------|-------|---------|-------|----------|------------|--------|
| ODWQS (µg/L) | | 5 | 100 | 120 | 100 | 190 | 280 | 150 |
| Sample Date & Type | | Results (µg/L) | | | | | | |
| 23-May-2019 | Raw | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | --- | --- |
| | Treated | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | --- | --- |
| 3-Jun-2019 | Raw | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | --- | --- |
| 11-Jun-2019 | Treated | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | --- | --- |
| 24-Jun-2019 | Raw | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | --- | --- |
| | Treated | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | --- | --- |
| 8-Jul-2019 | Raw | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | --- | --- |
| | Treated | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | --- | --- |
| 22-Jul-2019 | Raw | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <5.0 | --- |
| | Treated | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <5.0 | --- |
| 6-Aug-2019 | Raw | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <5.0 | <1.0 |
| | Treated | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <5.0 | <1.0 |
| 12-Aug-2019 | Treated | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <5.0 | <1.0 |
| 18-Nov-2019 | Treated | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <5.0 | <1.0 |

4 FLOW MONITORING

4.1 Overview

In accordance with Schedule 22 (Summary Reports for Municipalities) of O. Reg. 170/03, this Annual Report must include certain information for the purpose of enabling the Owner to assess the capability of the system to meet existing and planned uses. Specifically, this Report must include a summary of the quantities and flow rates of the water supplied during the reporting period, including monthly average and maximum daily flows. The Report must also include a comparison of flow monitoring results to the rated capacity and flow rates approved in the system's *Municipal Drinking Water Licence*.

4.2 2019 Flow Monitoring Results

Throughout the reporting period, the Atikokan DWS operated within its rated capacity and supplied a total of 673,698 m³ of treated water. On an average day in 2019 1,846 m³ of treated water was supplied to the community, which represents 31% of the rated capacity of the Atikokan WTP (6,048 m³/day). The maximum daily flow in 2019 was 3,834 m³/day, which represents 63% of the rated capacity of the facility. Flow monitoring results are summarized in Figure 1 and Table 13.

Figure 1: 2019 average and maximum daily treated water flows

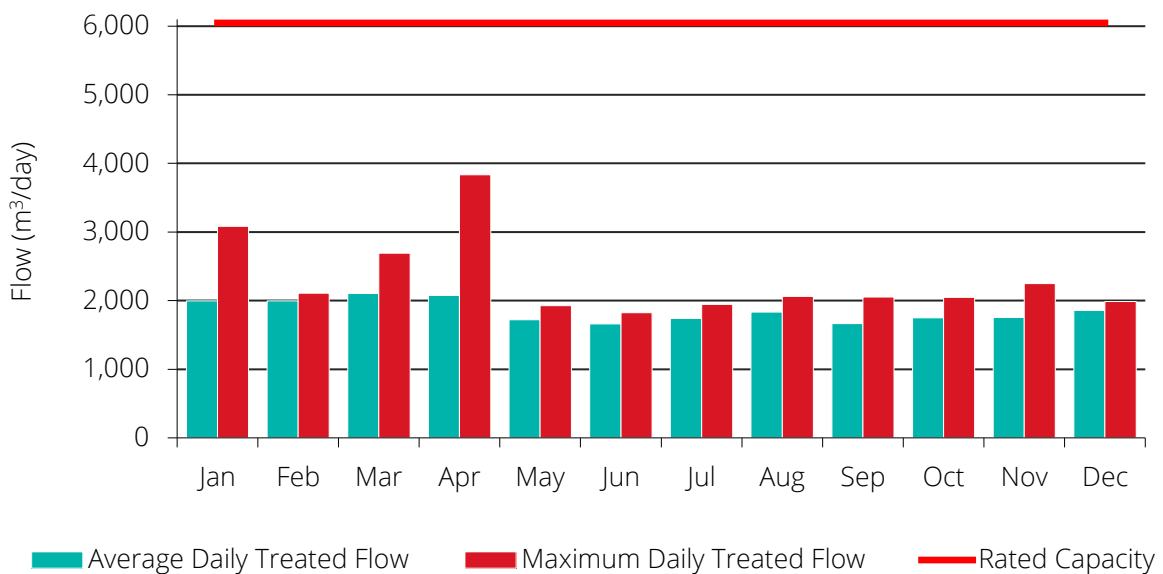


Table 13: 2019 flow monitoring results summary

| Month | Total Volumes (m ³) | | Daily Flows (m ³ /day) | | Capacity Assessments ¹ | |
|----------------|---------------------------------|----------------|-----------------------------------|-------------------------|-----------------------------------|-------------------------|
| | Raw Water | Treated Water | Average - Treated Water | Maximum - Treated Water | Average - Treated Water | Maximum - Treated Water |
| Jan | 69,360 | 61,870 | 1,996 | 3,085 | 33% | 51% |
| Feb | 62,540 | 55,874 | 1,996 | 2,109 | 33% | 35% |
| Mar | 74,020 | 65,290 | 2,106 | 2,690 | 35% | 44% |
| Apr | 75,090 | 62,232 | 2,074 | 3,834 | 34% | 63% |
| May | 64,120 | 53,432 | 1,724 | 1,929 | 28% | 32% |
| Jun | 61,980 | 49,860 | 1,662 | 1,823 | 27% | 30% |
| Jul | 63,460 | 53,969 | 1,741 | 1,944 | 29% | 32% |
| Aug | 66,290 | 56,781 | 1,832 | 2,060 | 30% | 34% |
| Sep | 62,400 | 50,036 | 1,668 | 2,053 | 28% | 34% |
| Oct | 64,790 | 54,219 | 1,749 | 2,046 | 29% | 34% |
| Nov | 59,670 | 52,587 | 1,753 | 2,250 | 29% | 37% |
| Dec | 65,740 | 57,548 | 1,856 | 1,986 | 31% | 33% |
| Total | 789,460 | 673,698 | --- | --- | --- | --- |
| Average | 65,788 | 56,142 | 1,846 | --- | 31% | --- |

1. Capacity assessments compare average and maximum daily treated water flows to the rated capacity of the treatment facility, as provided within the *Municipal Drinking Water Licence*.

4.3 Recent Historical Flows

Table 14 summarizes recent historical flow monitoring results for the Atikokan DWS. There were appreciable reductions in the amounts of source water withdrawn and treated water supplied in 2019 when compared to 2018. In addition to population factors, annual variations in average daily flows may be in part attributable to the frequency and severity of distribution system leaks and to the quantities of water used to prevent water lines from freezing. Total annual volumes of treated water supplied in the near future may be expected to be between 625,000 m³ and 825,000 m³, which represents approximately 28% to 37% of the rated capacity of the Atikokan WTP.

Table 14: Recent historical flow monitoring results

| Year | Total Volumes (m ³) | | Daily Flows (m ³ /day) | | Annual % Change | |
|----------------|---------------------------------|----------------|-----------------------------------|-------------------------|-----------------|---------------|
| | Raw Water | Treated Water | Average – Treated Water | Maximum – Treated Water | Raw Water | Treated Water |
| 2011 | 762,600 | 615,934 | 1,687 | 3,889 | -4.4% | -0.6% |
| 2012 | 747,243 | 642,622 | 1,756 | 3,082 | -2.0% | 4.3% |
| 2013 | 798,360 | 639,019 | 1,751 | 5,530 | +6.8% | -0.6% |
| 2014 | 943,794 | 789,592 | 2,163 | 3,770 | +18.2% | +23.6% |
| 2015 | 1,029,030 | 825,522 | 2,262 | 4,124 | +9.0% | +4.6% |
| 2016 | 771,350 | 656,030 | 1,792 | 3,389 | -25.0% | -20.5% |
| 2017 | 768,291 | 639,453 | 1,752 | 2,813 | -0.4% | -2.5% |
| 2018 | 927,760 | 785,846 | 2,153 | 3,464 | +20.8% | +22.9% |
| 2019 | 789,460 | 673,698 | 1,846 | 3,834 | -14.9% | -14.3% |
| Average | 833,548 | 688,756 | 1,887 | --- | --- | --- |

5 COMPLIANCE

5.1 Overview

Northern Waterworks Inc. and the Town of Atikokan employ an operational strategy that is committed to achieving the following goals:

- 1) Providing a safe and reliable supply of drinking water to the community of Atikokan;
- 2) Meeting or exceeding all applicable legislative and regulatory requirements; and,
- 3) Maintaining and continually improving the operation and maintenance of the system.

The following sections will summarize incidents of adverse water quality and regulatory noncompliance that occurred during the reporting period. NWI is committed to employing timely and effective corrective actions to prevent recurrence of all identified incidents of noncompliance and adverse water quality.

5.2 Adverse Water Quality Incidents

In accordance with section 11 (Annual Reports) of O. Reg. 170/03, this Report must summarize any reports made to the Ministry under subsection 18(1) (Duty to report adverse test results) of *the Act* or section 16-4 (Duty to report other observations) of Schedule 16 of O. Reg. 170/03. Additionally, this Report must describe any corrective actions taken under Schedule 17 of O. Reg. 170/03 during the period covered by the report.

There were two (2) adverse water quality incidents during the reporting period for the Atikokan Drinking Water System:

- **AWQI No. 145144 (April 8, 2019)**

As per Ontario's *Watermain Disinfection Procedure*, a distribution system repair for a water main break was classified as a Category 2 event and constituted an observation of improper disinfection. Multiple coincident repairs resulted in a localized loss of pressure affecting users on 140 to 170 Hemlock Avenue and at 204 & 205 Pine Crescent. The issue was reported to the Ministry's Spills Action Centre and to the Northwestern Health Unit on April 8, 2019.

Corrective actions included completing the repair, restoring pressure, issuing a localized and precautionary Boil Water Advisory, flushing water lines and collecting sets of microbiological samples. All samples tested absent for E. coli and total coliform parameters and the Boil Water Advisory was rescinded. The *Notice of Issue Resolution* was provided on April 23, 2019.

- **AWQI No. 145882 (June 26, 2019)**

As per Ontario's *Watermain Disinfection Procedure*, a distribution system repair for a water main break was classified as a Category 2 event and constituted an observation of improper disinfection. The emergency repair resulted in a localized loss of pressure affecting users on 1127 to 1235 O'Brien Street and the Charleson Recreation Facility. The issue was reported to the Ministry's Spills Action Centre and to the Northwestern Health Unit on June 26, 2019.

Corrective actions included completing the repair, restoring pressure, issuing a localized and precautionary Boil Water Advisory, flushing water lines and collecting sets of microbiological samples. All samples tested absent for E. coli and total coliform parameters and the Boil Water Advisory was rescinded. The *Notice of Issue Resolution* was provided on July 9, 2019.

5.3 Regulatory Compliance

In accordance with Schedule 22 (Summary Reports for Municipalities) of O. Reg. 170/03, this Report must list any requirements of the *Act*, the regulations, the system's approval, drinking water works permit, municipal drinking water licence, and any orders applicable to the system that were not met at any time during the period covered by the report (i.e. an incident of regulatory noncompliance). Additionally, this Report must specify the duration of the failure and the measures that were taken to correct the failure.

Two (2) inspections were conducted by Ontario's Ministry of the Environment, Conservation and Parks during the reporting period. The first inspection initiated on January 15, 2019 identified seven (7) incidents of regulatory noncompliance; the second inspection initiated on October 1, 2019 identified two (2) incidents of regulatory noncompliance. Information concerning the duration of failures and the measures taken to address those failures is provided below. The details of the noncompliance item and the actions required may utilize some or all of the original wording contained within the inspection report. Updates concerning the status of actions required have been provided where appropriate.

- **January 2019 inspection - Logbooks were not properly maintained and/or did not contain the required information.**

Two (2) violations were identified during the inspection concerning the distribution logbooks for the Atikokan DWS:

- A) O. Reg. 128/04, subsection 27. (4), states that "A person who makes an entry in a log or other record-keeping mechanism shall do so in a manner that permits the person to be unambiguously identified as the maker of the entry." On five (5) separate occasions during the inspection review period, an operator initialed next to a logbook entry but the initials did not match the names or initials of operators who were signed into the logbook at the time. This occurred on the following dates: April 10, April 18, May 11, May 28 and May 30, 2018.
- B) O. Reg. 128/04, paragraph 27. (5) 3., states that "An operator-in-charge or a person authorized by an operator-in-charge shall record the following information in the logs or other record-keeping mechanisms in respect of each operating shift: "...Any departures from normal operating procedures that occurred during the shift and the time they occurred."" On multiple occasions during the inspection review period, operators made entries in the logbook that described departures from normal operating procedures but they did not record the time that they occurred.

Action(s) Required: Distribution logbook violations were also noted in the 2017-18 Atikokan DWS Inspection Report, and although some improvements have been made, record-keeping in the distribution system continues to not meet the requirements prescribed in O. Reg 128/03, section 27. As such, the Town of Atikokan shall take the following actions:

- A) Within the two (2) time periods below, the Town of Atikokan shall facilitate record-keeping training for all certified operators who perform duties in the distribution system. Training shall include a review of O. Reg. 128/03, section 27.
 - February 15 - March 15, 2019; and
 - August 15 - September 15, 2019.

- B) To demonstrate compliance with A), the Town of Atikokan shall submit written confirmation that record-keeping training was administered, within one week following the training. Written confirmation shall include:
- the date that the training took place; and
 - the names and signatures of all operators present at the training.
- C) All documentation required by B) shall be sent to the attention of the undersigned water inspector by email.

Update: Training sessions pertaining to regulatory requirements for recordkeeping were administered to the Town of Atikokan water distribution operators on March 27 and September 5. An extension to the deadline for the first training session was granted by the Water Inspector. The training session involved reviewing and discussing 1) recent logbook violations, 2) regulatory recordkeeping requirements and O. Reg. 128/04 section 27, 3) common examples of regulatory noncompliance and 4) examples of actual logbook entries and opportunities for improvement. The records confirming the administration of training were submitted to the Water Inspector on March 28 and September 6.

- **January 2019 inspection - The overall responsible operator had not been designated for each subsystem.**

NWI provides Overall Responsible Operator (ORO) coverage for the Atikokan WTP and the Town of Atikokan provides ORO coverage for the distribution system. An ORO was not designated for the Atikokan distribution system for three (3) days during the inspection review period.

Action(s) Required: The Town of Atikokan shall ensure that an ORO is designated for the distribution system at all times. Documentation which provides verification of who is designated as ORO shall be made. By May 3, 2019, the Town of Atikokan shall provide a copy of the distribution logbooks, covering the period of February 1 - April 30, 2019, to the undersigned water inspector by email.

Update: A copy of the logbooks for the requested time period was submitted to the Water Inspector on May 1, 2019.

- January 2019 inspection - Operators in charge had not been designated for all subsystems which comprised the drinking water system.

NWI provides Operator in Charge (OIC) coverage for the Atikokan WTP and the Town of Atikokan provides OIC coverage for the distribution system. An OIC was not designated for the Atikokan distribution system for eleven (11) days during the inspection review period.

Action(s) Required: The Town of Atikokan shall ensure that an OIC is designated for the distribution system at all times. Documentation which provides verification of who is designated as OIC shall be made. By May 3, 2019, the Town of Atikokan shall provide a copy of the distribution logbooks, covering the period of February 1 - April 30, 2019, to the undersigned water inspector by email.

Update: A copy of the logbooks for the requested time period was submitted to the Water Inspector on May 1, 2019.

- January 2019 inspection - All sampling requirements for lead prescribed by schedule 15.1 of O. Reg. 170/03 were not met.

As a result of plumbing lead exceedances in April 2018, the Town of Atikokan was required to return to standard lead sampling as per O. Reg. 170/03, Schedule 15.1. Given the population of Atikokan, standard lead sampling includes twenty (20) plumbing samples from residential locations, two (2) plumbing samples from non-residential locations and four (4) distribution samples. The required number of plumbing samples were taken on October 11, 2018; however, only two (2) distribution samples were collected.

Action(s) Required: Effective immediately, all future standard lead sampling shall include four (4) distribution samples. By April 30, 2019, the Town of Atikokan shall forward the lead results from the December 15, 2018 - April 15, 2019 sampling window to the undersigned water inspector by email.

Update: The lead results for the Winter 2018/2019 sample period were submitted to the Water Inspector on April 30, 2019. To prevent incident reoccurrence, NWI's Compliance Department assumed certain administrative responsibilities with respect to the Town's lead sampling program.

- **January 2019 inspection - Corrective actions as directed by the Medical Officer of Health had not been taken by the owner and operating authority to address exceedances of the lead standard.**

Four (4) lead exceedances in residential plumbing occurred during the inspection review period. Therefore, O. Reg.170/03, Schedule 15.1, section 15.1-10 applies, which requires a DWS owner to take all steps to correct the issue, as directed by the medical officer of health [i.e. Northwestern Health Unit (NWHU)]. For the above noted lead exceedances, the Town of Atikokan did not consult with the NWHU to determine what corrective actions were required, if any.

Action(s) Required: Effective immediately, and with respect to all future lead exceedances, the Town of Atikokan shall take all corrective actions as directed by the NWHU. If any of the lead samples collected in 2019 exceed the lead standard (i.e. 10 µg/L), the Town of Atikokan shall notify the undersigned water inspector of the corrective actions required by the NWHU, if any. Notification shall be provided to the undersigned water inspector within 24 hours of receiving direction from the NWHU.

Update: The NWHU and the Water Inspector were involved in the management of subsequent lead exceedances. To prevent incident reoccurrence NWI's Compliance Department assumed certain administrative responsibilities with respect to the Town's lead sampling program, including managing adverse results.

- **January 2019 inspection - All reporting requirements for lead sampling were not complied with as per schedule 15.1-9 of O. Reg. 170/03.**

O. Reg. 170/03, Schedule 15.1, section 15.1-9. (1) states that, within seven (7) days of receiving the test results from a lead sample, a DWS owner shall provide the following information to the occupant of the premises where the lead sample was taken:

- A copy of the report (i.e. test results);
- A statement of whether or not the result exceeded the standard;
- Any advice given by the medical officer of health if the standard was exceeded; and
- The phone number of a person who can answer questions about the test results.

On October 19, 2018, ALS Laboratory reported to the Town of Atikokan that two (2) of the lead samples taken on October 11, 2018 exceeded the standard for lead. The occupants of the premises from where the samples were collected were not provided the above noted information until October 29, 2018; ten (10) days after the Town of Atikokan received the test results. In addition, no information was provided concerning the advice of the medical officer of health.

Furthermore, O. Reg. 170/03, Schedule 15.1, section 15.1-9. (5) states that, within 24-hours of receiving a report (i.e. test results) from the laboratory for any samples that exceeded the lead standard, the DWS owner shall provide a copy of the test results to the medical officer of health (i.e. NWHU). The Town of Atikokan did not provide a copy of the above noted test results to the NWHU.

Action(s) Required: Effective immediately, the Town of Atikokan shall comply with all reporting requirements as prescribed by O. Reg. 170/03, Schedule 15.1, section 15.1-9. By May 3, 2019, the Town of Atikokan shall provide to the undersigned water inspector, copies of all letters which were sent to homeowners as a result of the lead sampling performed during the December 15, 2018 - April 15, 2019 sampling window. Copies are to be sent by email.

Update: All lead results and notification letters pertaining to the Winter 2018/2019 sampling window were submitted to the Water Inspector prior to May 3, 2019. Regulatory reporting protocols were followed for all subsequent exceedances. The NWHU and the Water Inspector were involved in the management of subsequent lead exceedances. To prevent incident reoccurrence NWI's Compliance Department assumed certain administrative responsibilities with respect to the Town's lead sampling program, including managing adverse results, preparing the notification letters and coordinating their delivery.

- **January 2019 inspection - All changes to the system registration information were not provided within ten (10) days of the change.**

During the inspection, the current Atikokan DWS profile information was reviewed with operators. It was noted that the sections titled "Owner Alternate Contact" and "Owner Alternate Contact Info" require updating.

Action(s) Required: By February 28, 2019, the Town of Atikokan shall complete and submit a "Drinking Water System Profile Information Form" by email.

Update: The form was completed and submitted to the Ministry on February 21, 2019.

- **October 2019 inspection - Where an activity has occurred that could introduce contamination, all parts of the drinking water system were not disinfected in accordance with Schedule B, Condition 2.3 of the Drinking Water Works Permit.**

Section 2.0 of Drinking Water Works Permit (DWWP) 221-201 outlines the requirements for disinfecting parts in the DWS that come into contact with drinking water, when they are added, modified, replaced, extended or taken out of service for inspection and/or repair. Disinfection must be performed in accordance with a Director approved procedure (e.g. AWWA C563 - Standard for Disinfection of Water Treatment Plants).

During the inspection review period, operators stated that they performed repairs on high lift pump #1 which required disinfection prior to placing the pump back into service. Although operators stated that they performed disinfection, they were unfamiliar with the applicable Director approved procedure and the records of the repair did not show that an approved disinfection procedure was followed.

Action(s) Required: Following the inspection, this item of non-compliance was discussed with the operating authority (NWI). NWI described their typical procedure for disinfection of parts in the DWS that come into contact with drinking water. The procedure includes developing a task-specific SOP that adheres to DWWP and AWWA requirements. The procedure also encourages detailed record keeping.

Once aware of this non-compliance, NWI sent a company-wide email on November 18, 2019 to all operations staff which outlined the DWWP requirements and NWI protocol to be used. No further action is required at this time.

- **October 2019 inspection - The following instance(s) of non-compliance were also noted during the inspection:**

O. Reg. 128/04, Section 27. outlines the regulatory requirements for maintaining logbooks. Issues of noncompliance related to Atikokan's distribution logbooks have been identified and highlighted in the previous two inspections (2018, 2017). During the inspection review period for this inspection, NWI administered record-keeping training to all operators on March 27th and September 5th, 2019.

A review of the distribution logbooks revealed that there has been progress with respect to logbook compliance; however, the undersigned water inspector noted the following logbook non-compliance during the inspection: An operator initialed next to a logbook entry but was not signed in as an operator for that day; the operator who made the initials could not be identified as required by O. Reg 128/04, Section 27.(4). This occurred on three (3) occasions.

Action(s) Required: During the inspection, the undersigned water inspector discussed the logbook non-compliance with the Town of Atikokan. On October 16, 2019, the undersigned water inspector received a letter from the Atikokan Director of Public Works, which addressed the issues. The Town stated they would be holding a meeting with all distribution staff to discuss logbook compliance and that they would perform in-house logbook inspections.

By January 10, 2020, the Town of Atikokan must provide the undersigned water inspector with a copy of all distribution logbook entries for the months of October, November & December 2019. Copies may be sent by email

Update: A copy of the logbooks for the requested time period was submitted to the Water Inspector on January 9, 2020.